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EMBEDDING BEETLES IN PLASTIC

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An unsaturated polyester resin called Selectron has been found to be a suitable plastic for embedding insect specimens to prevent them from being mutilated by constant handling by field men. The writer has been successful in embedding beetles, such as the Japanese beetle, the European chafer, the white-fringed beetle, and several species of June beetles.

The beetles used in this process had been preserved in 75-percent alcohol. They were taken from that alcohol and placed first in 95-percent and then in absolute alcohol, being kept in each 24 hours, to remove any water that might be present. They were then placed in anhydrous ether for a period of several hours to a few days, to displace the alcohol. Finally to remove the ether, the beetles were placed in a desiccator, which was slowly evacuated to a pressure of 22 to 25 inches of mercury, and then they were dried for 24 to 48 hours, or even longer (fig. 1). All operations under reduced pressure were at 22 to 25 inches of mercury.

The plastic for the first layer was made by adding to the resin tertiary butyl hydroperoxide, which catalyzes or speeds the setting, at the rate of 25 drops to every 100 cc., since a layer 1/8 to 1/4 inch thick was used. For thicker layers less hydroperoxide should be added. The mixture was thoroughly stirred and allowed to stand until all bubbles had disappeared. It was then poured into shell vials[1/] (fig. 2, C) to form a bottom layer on which to place the specimens. The shell vials were left at room temperature until the plastic began to set, and then the dried specimens were placed on the layer.

A specimen may be placed vertically or dorsal side down, or may be laid on its side, as is done with the white-fringed beetle to show the white fringe. It all depends on what characters one wishes to show (fig. 3). The plastic should be hard enough to support the specimens, but not so hard as to prevent the specimens from settling slightly into the material and becoming set. If the specimens do not become fixed to the bottom layer, they are likely to rise when the second layer is applied. In the tests here reported it took approximately 2 hours for the plastic to set at room temperature.

Vials containing the specimens were again placed in the desiccator, and the vacuum pump was turned on for about 5 minutes. The vials were left in the desiccator overnight at normal pressure.

1/ Shell vials for this work are 20, 25, and 33 mm. in diameter and 60 mm. tall. They may be purchased for approximately $2.50 to $3.00 per gross.

The second layer was prepared in the same manner and was poured over the specimens and onto the first layer. The vials were again placed in the desiccator, and the vacuum was applied and released three or four times, until all bubbles from the specimens disappeared. The vials were then removed to room temperature and the second layer was allowed to set.

The vials were then placed in water and heated for an hour or two at 100°-120° F. Heat application at this time is very critical and must not be permitted to go too high. The vials were then cracked (not broken) with a light hammer to permit the expansion of the plastic so that the specimen was not squeezed. It is very important that the cracking be done gently, and not until the plastic has set fairly well. The temperature of the water was then raised to 160° or 170° F. and held for 30 to 40 minutes. The vials were left in the water overnight to permit a gradual cooling to room temperature. In the morning the plastic mounts (fig. 3) were removed from the vials, and they usually drop out without any difficulty.

An infrared lamp (fig. 2, B) may be used to assist in the hardening of the plastic. A 10- to 15-minute application with the bulb 12 inches from the vials aids greatly in hardening the top layer, but this is not necessary.

This process differs considerably from that used by Ward.[2/] Our method eliminates putting the specimens in an uncatalyzed plastic before placing them on the first layer. When we followed Ward's procedure, "halos" formed around the specimens, but halos were not present when our method was employed. The vials were cracked to prevent pressure against the beetles during the hardening process, which would have caused the plastic to pull away from the specimen later, making the mount useless as a means of proper identification of the specimen. Shell vials were used to avoid sawing up the blocks, which is necessary when several specimens are placed in large blocks. It is only necessary to grind and polish the top surface of the mount, that is, unless the bottoms of the vials are irregular, in which case the bottom of the mount will also have to be ground and polished. By our method the sides and bottom of the mount, which are in contact with the glass, will be smooth and clear.

The top surface, which does not come in contact with the glass, is concave because of shrinkage, and must be smoothed down first with coarse emery or sandpaper, and later with fine (No. 280) and finally with extra fine (No. 500 or 600) sandpaper. The mounts are then polished on rag wheels (fig. 4), with white chrome rouge or polishing compounds.

2/ Ward's Nat. Sci. Bul. 20 (3): 39-42. 1947.

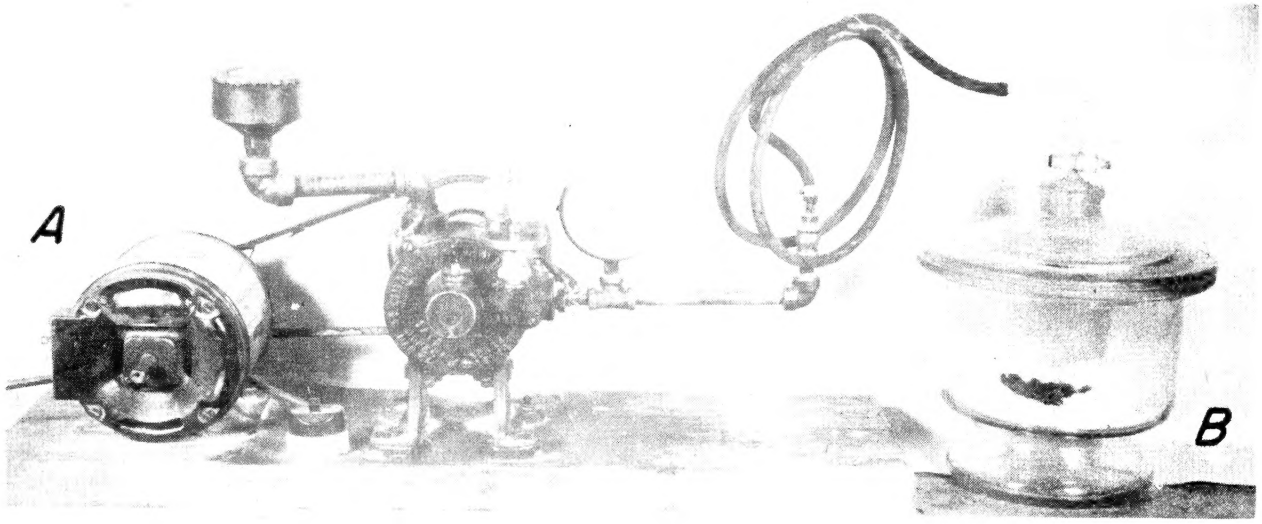
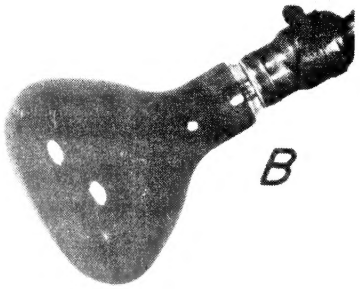


Figure 1.--Vacuum pump (A) and desiccator (B) used to evacuate specimens.



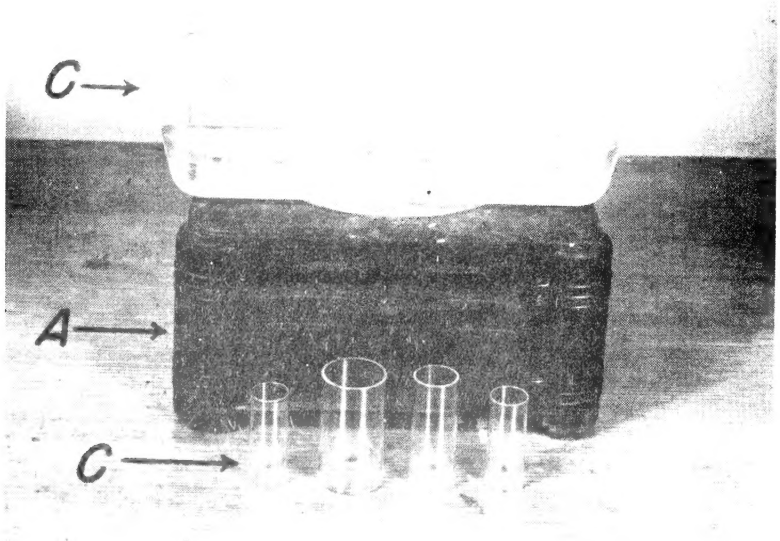


Figure 2.--Electric hot plate (A) and infrared lamp (B) for heating vials (C) containing plastic specimens.

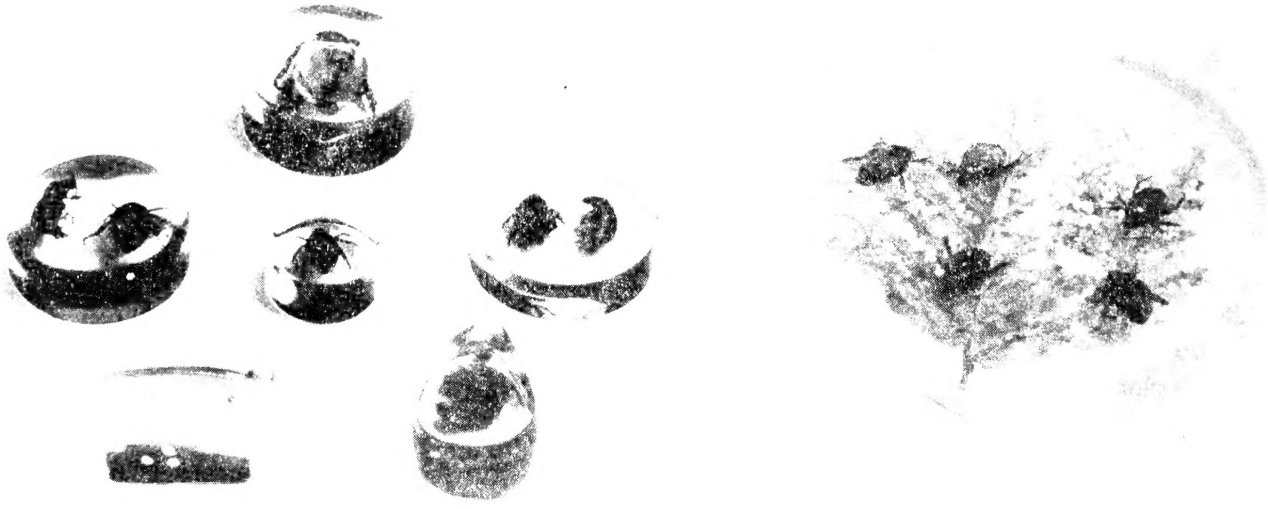


Figure 3.--Various specimens prepared in plastic mounts.

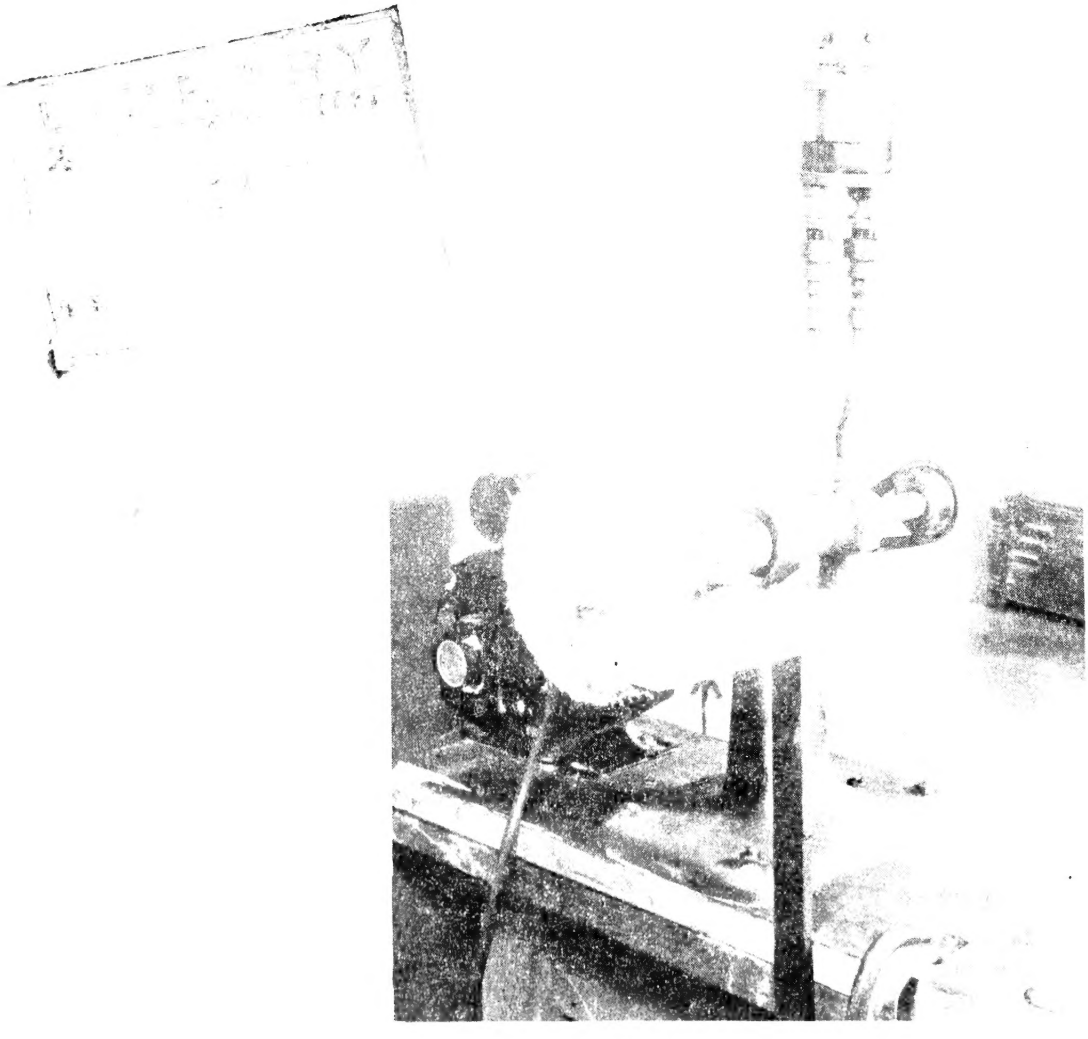


Figure 4.--Rag wheel for final polishing of mounts.